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Antarctic total ozone distribution climatology in connection with possible impact to ecosystem

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Planetary waves in the total ozone distribution in Antarctic region are studied in connection to extreme Antarctic Peninsula climate warming observed last decades. Analysis of the satellite measurements by TOMS spectrometer in a period 1979-2005 shows the existence of considerable zonal asymmetry in total ozone distribution over Antarctica. This asymmetry is caused by existence of quasi-stationary planetary waves (Rossby waves) in a polar stratosphere. Total ozone content distribution is convenient indicator for the Rossby waves study in the Antarctic region. It was obtained, that in the latitudinal interval of 55-75°S in spring months (September-November) exist: (1) the greatest amplitude of zonal wave (to 60 DU) and the wave amplitude growth rate (65°S latitude); (2) the region of zonal minimum experienced the systematic trend - displaced to the east from ~50°W longitude to Greenwich meridian; (3) the geographical location of extremums in 55-75°S latitude band reproduces the contour of mainland in the correspondent longitude sectors; (4) zonal asymmetry: a minimum and maximum of quasi-stationary Rossby wave are situated almost symmetric relatively the South Pole - minimum over the Weddell Sea - Antarctic Peninsula, and maximum in the Australian sector of Antarctic region. Zonal asymmetry in total ozone distribution in the Antarctic region and of long-term (climatologic) changes of zonal asymmetry must substantially affect ecosystem of the South Ocean, in particular in development of plankton community and krill population. Quasi-stationary minimum ozone position over Weddell Sea and its systematic eastern shift during 25 years caused the increased UV radiation of sea surface in comparison to Australian

sector, where ecosystem have to experience the lack of UVR. The spring ozone distribution asymmetry and its longitude trend have to become apparent in the features on dynamic and characteristics of populations as whole and individuals on different level. These peculiarities in connections with asymmetry of climate change in Antarctic region (Antarctic Peninsula warming and East Antarctica cooling) are discussed.

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